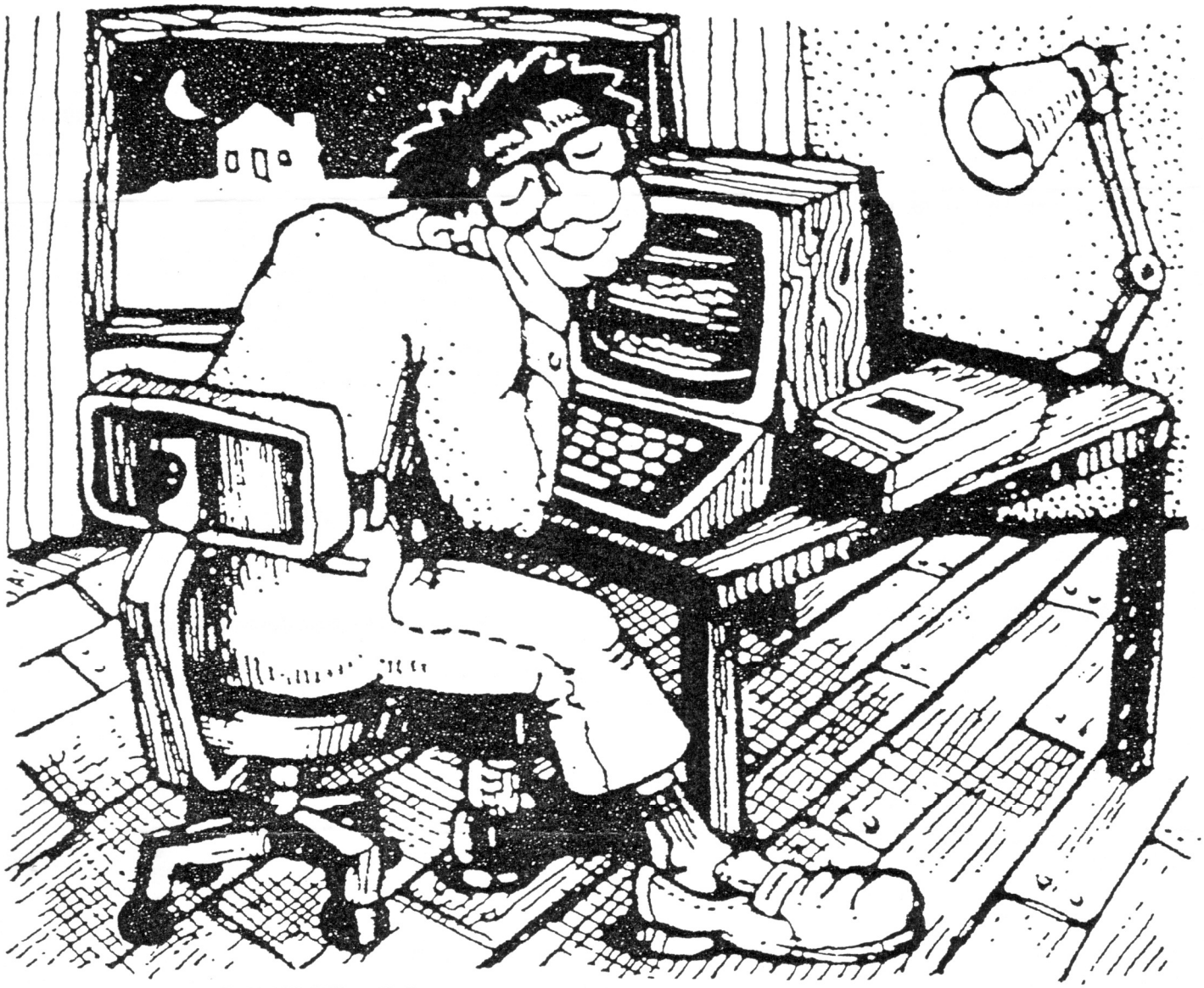
VZ LINK magazine



ISSUE 59 SEPTEMBER 1991

NEW ZEALAND

VZ 300/200
COMPUTER USERS CLUB

ODDS AND ENDS

Well, here we are with another issue of VZ LINK.
It has been hard working out what to put in this issue. I have a fair bit of material at the moment, but unless you want to see a complete newsletter with all items written by just one or two people then it does become a problem.
Please send in those programs and items that you have written. I can't produce a newsletter without your input.

There are still a lot of out standing subscriptions due. If yours is one of them please forward it as soon as possible. The club relies on these to continue the newsletters. If you are not sure when and if yours is due contact me and I will tell you. The next issue will be your last if you are more than three months overdue.

REMEMBER

If you want to contact me about any problems the phone number is now: Ph. 520-6743
If it is really urgent you can contact me at work, the number is now: Ph. 270-5389

CLUB MEETING

The last club meeting for the year will be held on :-

>>>>>>>>>>>>>>>>>>>> SATURDAY 30 NOVEMBER 1991 <<<<<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>>>>>>>>>>> Starting at 10.00 am. <<<<<<<<<<<<<<<<<<<<<<<<<

This date is confirmed, please mark it on you calendar.
Hopefully we will have a new venue for November. Details in the next issue.

FOR SALE

Steelo Lemon soap pads, box of 10 for $1.00
Cassette Leads approx 1 metre long for $7.00 each (suppled by Ken Clarke)
Disks for $1.00 each /Cassettes for $2.00 each.
All proceeds to club funds.

@@@

Disk Crash Recovery

PART I of a Series:

Accidental loss of Disk programmes can and does occur. But! But! But! - Can any of the material be recovered? Variably yes! The task may appear daunting and even unconquerable - but never say die - for sink or swim - with bulldog courage, patience and my notes as your guideline - you too can do it!

I intend that these notes be concise. Should further explanation be needed - then do ask.

Firstly, you will need a programme that can Read/Write and Display the contents of Sectors as required, such as the "Disk Doctor" from Bob Kitch's "Tool Kit". Or, if you like to roll your own, then refer to VZ LINK (July to November, 1989), where you will find a programme (though not so sophisticated). This latter programme has great potential, and in further articles in this series, I will be exploring its potentials in greater depth.

Secondly, what usually goes wrong?
(a) A Disk I/O Error - This is normally a 'break in the chain.' Or, in other words the Disk wants to use a Sector that it can't get access to.
(b) You Forgot to Open the Drive Before Switching Off Error - Sometimes, on Switch-Off the Drive will momentarily take the Disk for a spin and Write a few hieroglyphics in an ancient language, that the drive wont be able to read at a later date. Because Track 0 is the Directory Track and is on the outer edge of the Disk, where the head may be when this Error occurs - you will lose the Directory and also in all probability the Track Map as well. Without a Directory, the Drive behaves like a chook without its head. In fact it thinks the whole Disk is un-Init'ed, whereas invariably it is only ONE TRACK 'gone west'.

Thirdly, I present some pictorials of Sector printouts to graphically illustrate all the important information you will need to know.

by

Ken Clarke.

```
54 3A 44 4C 4F 47 20 20 T:DLOG
20 20 01 00 E9 7A A8 90   ...:..
42 3A 42 49 2D 43 4F 50 B:BI-COP
59 20 03 0D 50 C3 76 C5 Y ..P.6.
57 3A 4D 41 4E 55 41 4C W:MANUAL
31 20 04 02 79 C9 00 D0 1 ..9...
57 3A 43 4F 50 49 45 52 W:COPIER
20 20 05 00 13 A8 8D A9   ......
44 3A 52 54 54 59 20 20 D:RTTY
20 20 0E 09 00 00 00 00   ......
42 3A 49 4E 44 45 58 20 B:INDEX
20 20 05 03 E9 7A 74 7B   ...:4.
54 3A 48 41 43 4B 45 52 T:HACKER
32 20 05 05 00 B0 93 C8 2 ......
00 00 00 00 00 00 00 00 ........
00 00 00 00 00 00 00 00 ........
```

Basic File.
Machine Code.
E&F Word Processor File.
Editor Assembler Source File.
Data File.
Copy Protected Basic File.

Fig. 1
A Directory Sector showing different File Types.

File Type.
Delimiter.

```
54 3A 44 4C 4F 47 20 20 T:DLOG
20 20 01 00 E9 7A A8 90   ...:..
```

File Name.
Where Pgm will end.
Where Pgm will load to.
Track & Sector where Pgm starts on Disk.

Fig. 2
A single Directory entry.

```
04 7B 05 00 93 20 22 E0 ..... ".
E0 E0 C4 D8 E0 E0 CC CF ........
C7 E0 E0 C2 CF CF CB E0 ........
E0 E0 00 2E 7B 0A 00 B1 ........
33 30 37 34 34 2C 31 3A 30744,1:
B1 33 30 38 36 32 2C 38 .30862,8
30 3A B1 33 30 38 36 33 0:.30863
2C 35 32 3A B8 31 30 30 ,52:.100
30 30 3A 84 00 34 7B 0F 00:..4..
00 B2 00 65 7B 14 00 56 ...%...V
5A 24 D5 22 56 5A 2D 32 Z$."VZ-2
30 30 2F 33 30 30 20 43 00/300 C
4F 4D 50 55 54 45 52 20 OMPUTER
44 58 20 4C 4F 47 20 42 DX LOG B
4F 4F 4B 2E 22 3A B2 56 OOK.":.V
5A 24 3B 00 96 7B 01 01 Z$;.....
```

Track & Sector where the next Sector can be found.

Fig. 3
First Sector of a programme.

```
43 3B 44 3B 45 3B 46 3B C;D;E;F;
3A B2 2C 00 09 7D B4 00 :.,.....
8F 46 D5 34 30 CA AF 22 .F.40..."
2A 20 54 4F 54 41 4C 20 * TOTAL
3D 20 22 3B 47 3A AF 00 = ";G:..
25 7D B9 00 8F 46 D5 34 %....F.4
30 CA B2 22 2A 20 54 4F 0..."* TO
54 41 4C 20 3D 20 22 3B TAL = ";
47 3A B2 00 2D 7D BE 00 G:..-...
8D 32 30 00 00 00 00 00 .20.....
00 00 00 00 00 00 00 00 ........
00 00 00 00 00 00 00 00 ........
00 00 00 00 00 00 00 00 ........
00 00 00 00 00 00 00 00 ........
00 00 00 00 00 00 00 00 ........
00 00 00 00 00 00 00 00 ........
```

Second to Last Line Information

Last Line number

Address of Pgm End.

End of Line Markers.

Fig. 4
Last Sector of a Basic programme.

Fourthly comes the tricky part of how to do it!

(a) For Disk I/O Errors, try the following steps.

(i) Note down the Directory Information (fig.2) on a piece of paper.

(ii) Change to the Start Sector of the Programme.

(iii) Look at the Last Two Bytes (fig.3) where the Next Sector is be found.

(iv) Change to this Next Sector.

(v) Keep repeating this procedure.

(vi) If you reach a Sector where the Last Two Bytes are "0000", then all is OK with that programme.

(vii) If you can't Read a Sector, then that Sector is faulty.

(viii) It is sometimes possible to change the Last Two Bytes on the Last Sector Read to "0000" or to scout around for the Next Accessable Sector and use that Track and Sector Address instead.

(ix) This palliative, while usually successful on Data Files with little resultant loss of information, may cause disastrous crashes on other file types.

(x) Further 'band-aiding' such as changing the Ending Address (fig. 2) may assist a partial recovery.

(xi) Sometimes a little 'surgical' work may help.

(xii) There are too many possibilities to cover each case here - but don't give up too soon, as there may be other solutions.

(xiii) A Disk with an I/O Error will need to be re-Init'ed at some stage soon, so preferably start recovery operations by doing a DCOPY "pgm" of each programme - one at a time to a known Clean Disk.

(xiv) Don't try and DCOPY the whole Disk. You are just as likely to shift the I/O Error to the Clean Disk!

(xv) Good Data Files or Repaired Data Files (as above) can be Loaded into their Parent programme and Saved to the Clean Disk. (DCOPY of individual files wont work with Data Files.)

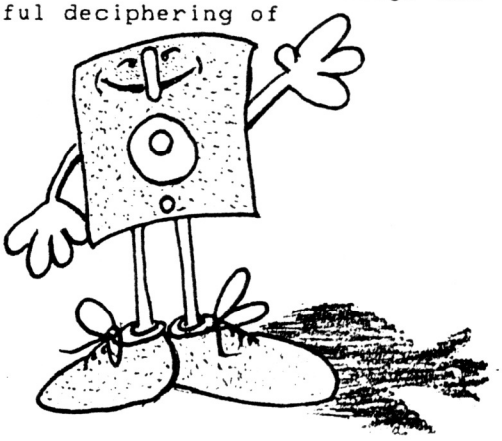
b) Lost Directories and Track Map require several steps.

(i) Transfer each and every Sector that has been written to, by Read/write operations - one by one. It takes time - often a long, long time!

(ii) Research the Sectors one by one and note down on paper the Start and End Track and Sector for each programme.

(iii) Now start to write a New Directory on paper (fig.1).

(iv) You will probably have some first-hand knowledge of what programmes were on disk. With this knowledge and some careful deciphering of Sector information, the different Types can be identified.



(v) The File Name is not important except that unused name spaces must be filled with spaces (20 hex).

(vi) The Start Track and Sector is entered. (fig. 2)

(vii) Practically all Basic (T) and a few (B) programmes have a Load-Start Address of "E97A".

(viii) "D" Files show NO Load-Start Address and NO End Address. i.e. "0000".

(ix) "W" Files (E & F Word Processor)* all show the same figure of "00D0" in the Right-Hand column. The calculation for the first or Left-Hand column is by adding up the Bytes used and subtracting this from the above.
i.e. 53248 (D000)-2233 Bytes=51015 (C747).
The figure in the Left-Hand column becomes "47C7".

(x) "B" Picture Files from "Art Gallery" show Load-Start Address of "0070" and an End Address of "0178".

(xi) The Ending Address of Basic programmes are calculated from the Last End of Line Address (fig. 4). Just add 2 x Bytes to the Left-Hand pair of figures
i.e. "AA7F" would become "AC7F".

(xii) The ending Address of "B" programmes are calculated by adding up the Bytes used (total Sectors x 126 + Bytes used Last Sector) and adding this to the Load-Start figure.
i.e. 550 Bytes+50000 (C350)=50550 (C576) ... [50C3 76C5]

(xiii) REMEMBER:

a) To convert between Hex and Decimal.

b) What you see on the Sector readout needs flipping over to get the figures in their right perpective (as they appear in a LO-HI format).

(xiv) NOTE* The fastest and most expedient method to get those figures is to look at somebody else's disk, if at all possible.

(xv) You will no doubt have noted that I have avoided "B" Machine Code Load-Start Address information. If it is all Machine Code - I don't know of a simple calculation. But if it is a Copy Protected Basic programme, which carefully dissecting and translating the Sectors would show, then the Load Start/End will conform to the information in paragraph (vii) and (xi) above.

Well that's it folks! That's the 'Cure'. In a later article, I will detail some 'Medicine' to ease the 'Pain' of Disk Recovery.

*

If you are using either the new improved or modified for extra memory version of the E & F W.P., then the above quoted figure will differ.

LIVENUP

PART FOUR

by Bob Kitch.

```
10 '*************************
20 '***    THROW-UP       ***
30 '*** PROGRAM III OF III***
40 '*** TO LOAD 24 HI-RES ***
50 '*** SCREENS INTO 64K  ***
60 '*** MEM. EXP.         ***
70 '***  BOB KITCH  6/88  ***
80 '*************************
3398 '
3399 '***SEE IF MEMORY BLOCK LOAD SELECTED.
3400 A$=CHR$(PEEK(30791)):IF A$="2"THEN GOTO 7000
3498 '
3499 '***PUT UP INTRO MESSAGE.
3500 GOSUB 5020
3510 PRINT"NOW IT'S TIME TO HAVE A GOOD          ***THROW-UP***"
3512 SOUND 8,5;0,3;8,5;0,3;8,5
3515 PRINT:PRINT"FOUR OPTIONS EXIST":PRINT
3520 PRINT" <0>  FANCY SCREEN MOVE"
3525 PRINT" <1>  PLAIN SCREEN MOVE"
3530 PRINT" <2>  MEMORY BLOCK SAVE"
3535 PRINT" <3>  MEMORY BLOCK LOAD"
3540 PRINT:INPUT"  INDICATE OPTION";A$
3545 IF A$="2" THEN GOTO 6000
3550 IF A$="3" THEN GOTO 7000
3555 IF (A$<>"1") AND (A$<>"0") THEN GOTO 3500
3560 GOSUB 5020
3565 PRINT"FOR A <PICTURE SHOW> DELAY      SELECT 10000 <24 SEC>
3570 PRINT"FOR AN ANIMATION DELAY          SELECT 100 <0.25 SEC>
3575 PRINT:INPUT"DELAY";D
3580 IF D<0 THEN GOTO 3500
3590 IF A$="0" THEN GOTO 4000
3598 '
3599 '***SET UP M/L ROUTINE FOR PAGING.
3600 POKE -16719,112              :'***MSB OF DEST TO 70H.
3610 MS%=-16722                   :'***MSB OF SOURCE PG. 0BEAEH.
3620 POKE 30862,171:POKE 30863,190:'***ENSURE USR VECTOR SET.
3698 '
3699 '***MAIN PLAIN DISPLAY ROUTINE.
3700 MODE(1)
3710 FOR I%=1 TO 3
3720    OUT 127,I%
3730    FOR J%=192 TO 255 STEP 8
3740       POKE MS%,J%
3750       K%=USR(0)
3760       FOR K%=0 TO D
3770       NEXT K%
3780    NEXT J%
3790 NEXT I%
3800 GOTO 3710
3998 '
```

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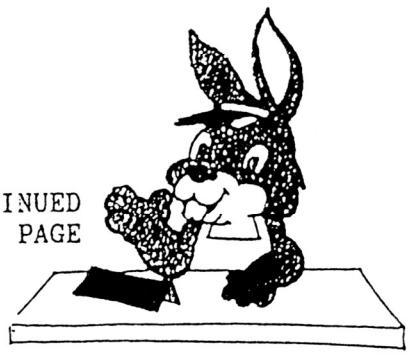

```
3999 '***MAIN FANCY DISPLAY ROUTINE.
4000 MODE(1):POKE 30863,188          :'***MSB 0BCH.
4010 FOR I%=1 TO 3
4020    OUT 127,I%
4030    FOR J%=3 TO 26 STEP 3
4040        POKE 30862,J%
4050        K%=USR(0)
4060        FOR K%=0 TO D
4070        NEXT K%
4080    NEXT J%
4090 NEXT I%
4100 GOTO 4010
4998 '
4999 '***SUBROUTINE FOR NEW SCREEN.
5000 PRINT@480,"[illegible]";
5010 A$=INKEY$:A$=INKEY$:IF A$="" THEN GOTO 5010
5020 CLS:PRINT@12,"[illegible]":PRINT:PRINT:RETURN
5997 '
5999 '***MEMORY BLOCK SAVE ROUTINE.
6000 CLS:PRINT@7,"MEMORY BLOCK SAVE"
6010 PRINT@64,"PUT IN NEW INITIALIZED DISK"
6020 INPUT"PRESS ANY KEY TO CONTINUE";A$
6030 PRINT@128,"SAVING BLOCK 1"
6040 OUT 127,1:BSAVE"BLOCK1",C000,FFFE
6050 PRINT@192,"SAVING BLOCK 2"
6060 OUT 127,2:BSAVE"BLOCK2",C000,FFFE
6070 PRINT@256,"SAVING BLOCK 3"
6080 OUT 127,3:BSAVE"BLOCK3",C000,FFFE
6090 GOTO 3500
6997 '
6999 '***MEMORY BLOCK LOAD ROUTINE.
7000 CLS:PRINT@7,"MEMORY BLOCK LOAD":POKE 30791,0
7010 PRINT@64,"PUT IN DISK CONTAINING 3 MEM.   BLOCKS"
7020 INPUT"PRESS ANY KEY TO CONTINUE";A$
7030 PRINT@192,"LOADING BLOCK 1"
7040 OUT 127,1:BLOAD"BLOCK1"
7050 PRINT@256,"LOADING BLOCK 2"
7060 OUT 127,2:BLOAD"BLOCK2"
7070 PRINT@320,"LOADING BLOCK 3"
7080 OUT 127,3:BLOAD"BLOCK3"
7090 GOTO 3500
9998 '
9999 '***UPDATE DISK FILE.
10000 ERA"THROWUP":SAVE"THROWUP"
20000 END
```

P.O BOX 1972 C.P.O AUCKLAND N.Z

AUCKLAND VZ 300/200 COMPUTER USERS CLUB (1986)
NEW ZEALAND VZ 300/200 COMPUTER USERS CLUB (1989)

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IMPROVING HI RESOLUTION GRAPHICS

Reprinted from XILOG magazine Vol 1 No.9.

The VZ is pretty limited in its graphics commands.
SET, RESET and POINT are the only ones available unless you POKE and PEEK to screen addresses. A few more commands would certainly not go amiss.
MOVE and DRAW are two commands available on a number of machines for which a lot of programs are already written and may be used on the VZ with very little effort.

MOVE is equivalent to :-

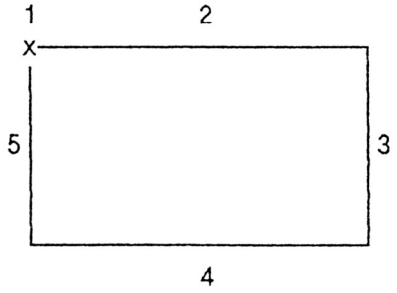
HPLOT on a APPLE
PLOT on a ATARI
MOVE on a BBC

DRAW is equivalent to :-

HPLOTTO on a APPLE
DRAWTO on a ATARI
DRAW on a BBC

MOVE merely sets the point at which a line drawn on the screen will begin, whilst DRAW determines the end point of the line and actually draws the line.
If subsequent DRAW commands are issued a line is drawn from the position of the previous DRAW command to that of the last DRAW command. Thus to draw for example a square on the screen the commands would be typically :-

```
10 MOVE 20,20
     ( go to position 1 )
20 DRAW 30,20
     ( draw line 2 )
30 DRAW 30,30
     ( draw line 3 )
40 DRAW 20,30
     ( draw line 4 )
50 DRAW 20,20
     ( draw line 5 )
```



To mimic these commands on the VZ a small subroutine is needed, which is listed below. It draws a line between two X,Y coordinates - A,B and C,D.

```
60000 IF A<CTHEN X1=A:Y1=B:X2=C:Y2=D:GOTO 60020
60010 X1=C:Y1=D:X2=A:Y2=B
60020 XX=X2-X1
60030 IF XX=0 THEN SL=1000ELSE SL=(Y2-Y1)/(X2-X1)
60035 IF ABS(SL)>1 THEN GOTO 60130
60040 SET(X1,Y1):FOR I=1 TO X2-X1-1:TX=X1+I
60045 TY=Y1+INT(I*SL):SET(TX,TY):NEXTI:SET(X2,Y2)
60120 GOTO 60150
60130 IF B<DTHEN X1=A:Y1=B:X2=C:Y2=D ELSE X1=C:Y1=D:X2=A:Y2=B
60140 FOR I=1 TO Y2-Y1-1:TY=Y1+I:TX=X1+INT(I/SL)
60145 SET(TX,TY):NEXTI
60150 A=C:B=D:RETURN
```

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NEXT PAGE

To use just enter the subroutine (and save for further use) then substitute :-

A=X:B=Y for MOVEx,y and

C=X:D=Y:GOSUB 60000 for DRAWx,y

The program to draw a square then reads :-

```
2  MODE(1)
10 A=20:B=20
20 C=30:D=20:GOSUB60000
30 C=30:D=30:GOSUB60000
40 C=20:D=30:GOSUB60000
42 C=20:D=20:GOSUB60000
50 GOTO 50
```

The subroutine is able to draw lines of any angle, including vertical, and packs the dots in the best format i.e.

Like this:-

```
x
 x
  x
   x
    x
```

and not like this:-

```
x

  x

      x

          x
```

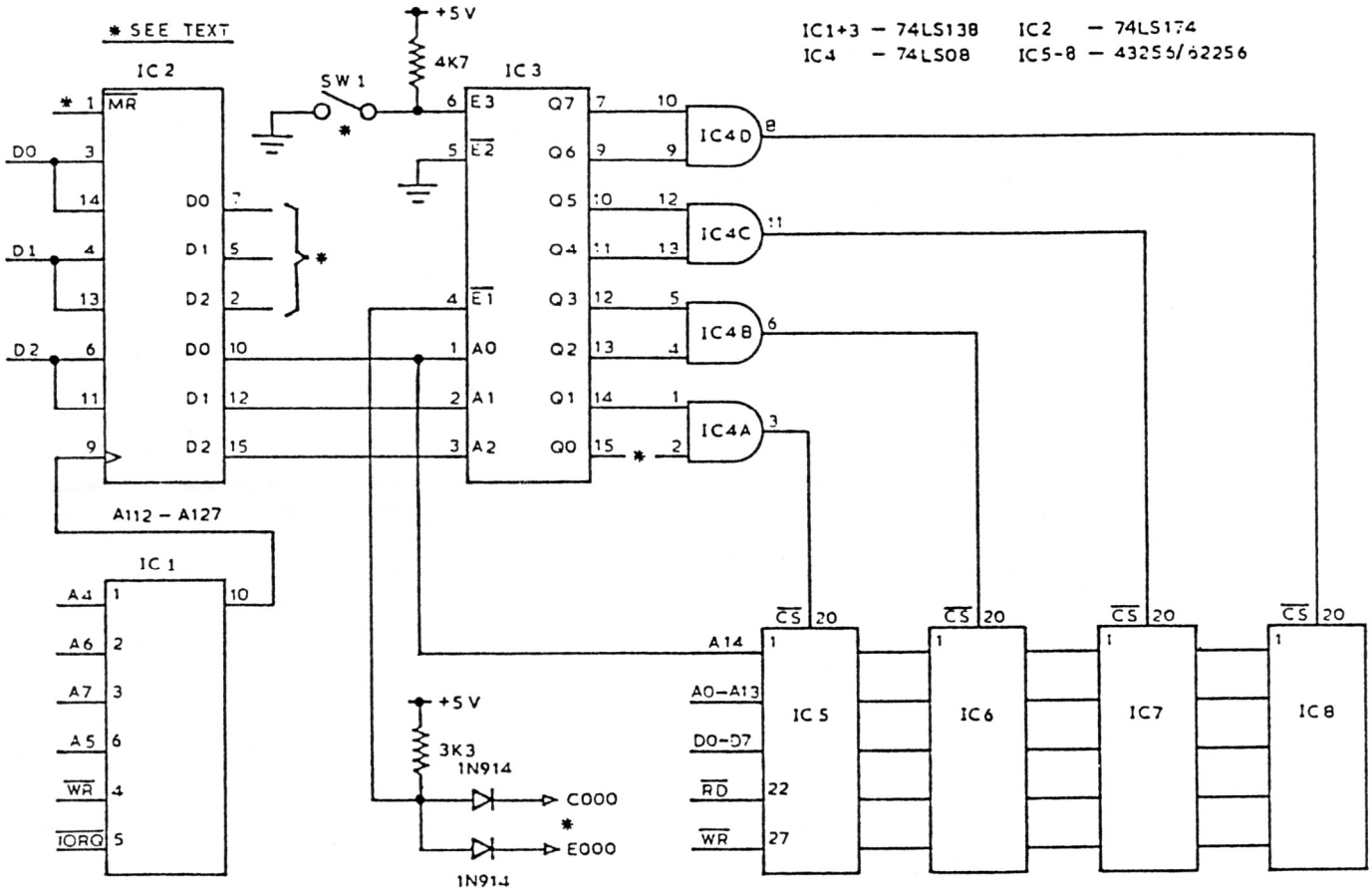
Potpourri

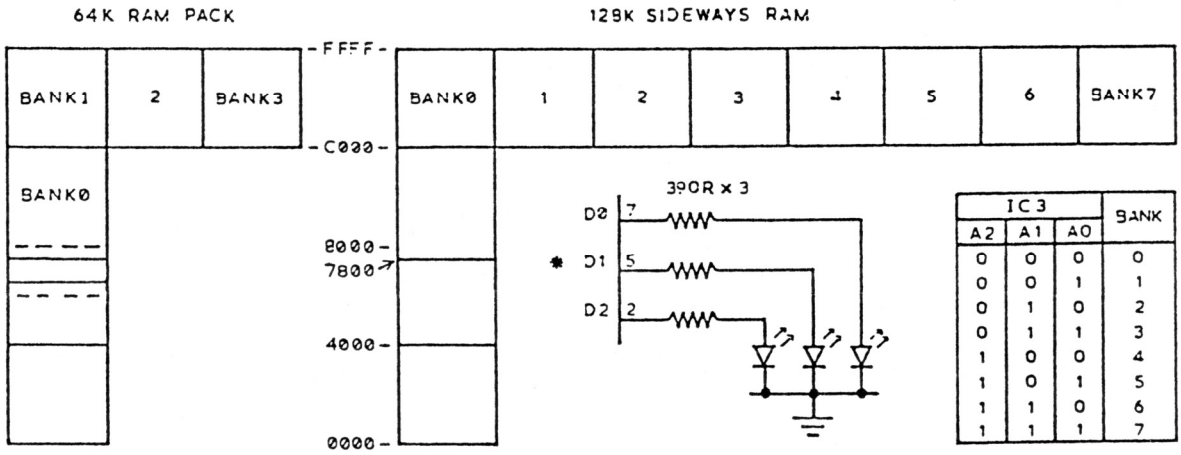
with Ken Clarke.

I will call this rambling 'BUG-SWAT' because if there is anything where each and everyone of us needs assistance, is in typing in a program - BUG FREE! Sending your eyeballs on a wild goose chase doing the 'Can-Can-Polka' between the written copy and the screen can become quite a chore. Especially on about the third time around when the BUG pops out of the screen and your eyeballs respond by popping out on stalks! A helpful hint you will find useful when BUG chasing is to firstly do an LLIST on the printer. Then starting at line 1, fold the print-out between this line and the next. Lay this just above the same line in the book and scan for correctness. Mark any errors with a highlighter pen. Continue line by line in this fashion through to the end, folding across the page under each line in turn. Using this method you will achieve far greater accuracy and quite frequently an error that has escaped notice before with other forms of checking, is more likely to be noticed. This method is also great for checking DATA statements or HEX & DECIMAL CODES.
***In fact this is now almost the only method that I use now, because I consider it the most fool proof.....

128K SIDEWAYS RAM (C) J.LEON

VZ 200/300 128K SIDEWAYS RAM (C) JOSEPH P. LEON 1988





IC 3			BANK
A2	A1	A0	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

NOTE ON IC'S 1 to 4 :-

Although 74LS Series IC'S are shown in above circuit and they will work as designed but if possible get for :-

IC1-74HCT138 IC2-74HCT174 IC3-74HC138 IC4-74HC08

The 74HCT Series are designed to interface between TTL and CMOS IC'S while the 74HC Series can drive TTL or CMOS IC'S. The HC/HCT IC'S have much lower power cosumption than 74LS IC'S, comparable speed and are preferable. The VZ power supply has its limits and every IC added puts an added load on the supply.

128K SIDEWAYS RAM CONT. . . .

VZ 64K memory cartridges are very hard if not impossible to get. For that reason I decided to design my own and this 128K SIDEWAYS RAM project is the result and it will give you more memory than you'll ever use.

Not all of you will need the full 128K and for that reason it was designed to start with 32K and expand in 32K steps as funds allow or need arises. And now to the circuit description. Construction details will be given in next issue.

We'll start with a look at the 64K RAM PACK. Of course as you may have realised by now the VZ memory map does not allow for more than 34K of user RAM, so BANK SWITCHING techniques must be used. The block diagram of 64K Ram Pack says it all. Each of the four banks consists of 16K blocks. Bank 0 is fixed between 32K and 48K while bank 1 resides at 48K to 64K and is the default at power up. Banks 2 and 3 can be switched in when desired.

Now if you have a look at 128K S/Ways Ram block diagram you'll notice that all 8 banks from 0 to 7 reside between 48K and 64K with only one bank available at any one time. By adding the 18K of Ram below 48K we get a total of 146K ram available to the user which puts a few big brand name computers to shame. And now to the circuit proper.

IC 1) The 74LS138 provides a decoded output in the address range of 112 to 127 which is used to trigger the latch.

IC 2) The 74LS174 is a HEX LATCH and was chosen so duplicate outputs could be obtained. One lot of outputs is used to select desired bank while the second lot of outputs are used to drive LEDS to indicate bank selected.

IC 3) This 74LS138 is used to decode banks 0 to 7.

IC 4) The 74LS08 is a quad and gate and each gate is used to enable each 32K Ram twice. The ZERO DATA line which goes to each A14 on the 32K RAMS is used to enable top or bottom 16K block on each 32K Ram chip.

IC 5-8) These chips are 32K X 8 Static Cmos Ram Memory Chips. They come under two different numbers - 43256 or 62256. Both are same exept they are made by different companies.

To understand the operation of this circuit as a whole you have to know or learn a bit about the BINARY system and digital logic. Refer to the truth table for IC 3.

* Pin 1 MR IC2 - This pin is connected to pin 2 (Reset) of edge connector. This has the effect of synchronized RESET of 128K Ram and VZ at power up.

* SW1 - This switch serves two functions.
1) Switch CLOSED - All O/P's on IC 3 are forced High which in turn puts a High on each O/P of IC 4 disabling all 32K Ram IC'S thus allowing WORDPRO cartridge operation.
2) Switch CLOSED before power up then OPENED after power up. This has the effect of lowering DOS communication region and T.O.M. below 48K and very usefull with disk drives.

* D0, D1 & D2 IC2 - These O/P's are used to drive LEDS to indicate selected bank and are optional.

* C000 & E000 - These I/P's require decoded 8K blocks in the range C000-FFFF and are used to enable the 32K Ram chips via IC3 & IC4. More on them in next issue.

* Q0 Pin 15 IC3 - As it stands the 128K S/Ways Ram is not compatible with existing 64K programs using bank switching because bank 0 is at 48K to 64K. The circuit changes (Minor) will be given next issue to make it compatible with the 64K Ram Pack.

ISLAND OF SECRETS

Adapted to the VZ by Pete Patterson

Island Of Secrets is a text adventure game. The game is different from the traditional adventure game because you play a role. You are Alphan and you must try to decide what he would do in a particular situation,rather than what you would personally do. Other roles are played by the VZ and characters sometimes move around,or do surprising things which you cannot control. You are given a certain amount of strength and wisdom at the beginning of the game and these vary according to what happens to you in your role of Alphan.

Alphan's task is to find the objects of power,though he doesn't know what they are, and take them to the Island Of Secrets. He must the work out what to do with them to restore light,warmth and life to the world. If you do something wrong you may find you have lost the game. The VZ will tell you,you have failed and give you a score based on what you have done up to that point. You will have to start again and try something different.

THE STORY OF ISLAND OF SECRETS

In the dim and distant past.....

the sky was blue and the grass was green. The Ancients had built The Pyramid and established communication with the Sky People. It was even agreed that one or two specially selected Earthlings should visit Sky Land.

The first (and last) Earthling Sky visitor was Omegan, the youngest son of the most influential of the Ancients. He was fascinated by what he saw-the Sky People knew a lot of things Earthlings didn't.

Shortly after Omegan arrived, conflicts began between the Sky People and the Outer Ones. Sky messengers came down to the Pyramid and gave each of the Ancients an object, telling them to hide it carefully. The Ancients wondered why the Sky People should bother to give them such ordinary looking objects. But,who were they to ask questions? They set off to find hiding places,little knowing they would never meet again.

It became obvious to the Sky People that a great war was inevitable,they sent Omegan back to Earth with a mission. The war would darken Earth,they said,but when it was over Omegan must collect the secret objects and release the power that had been locked into them,thus restoring the Earth to normal. They gave him the Cloak of Entropy which they said was essential for releasing the power of the objects and,because the task was too long for one person's lifetime,they also gave him the secret to prolong his life.

The war was more catastrophic than even the Sky People had anticipated. A huge dark cloud enveloped the Earth blocking out light and heat,the ground ripped apart forming the Crimson Canyon,and the lakes were poisoned.

Omegan set out on his task,but it soon became apparent that it was of immense and incredible difficulty. He didn't know what he was looking for,where to look,or even how many things he had to find. He realized that the cloak had enormous power. With its help,he built a castle for himself and assembled the equipment to extend his life. So what the Earth stayed dark,he thought. No-one would find all the objects,and the cloak-that was his now.

That was all a long time ago....

but the land is still in darkness and Omegan stil lives on his Island of Secrets. No one has found the objects or discovered the secret of Omegan's long life,though there are rumours of some who have tried. Tales are told of a wanderer named Median,who entered the Castle of Secrets. He even drew a plan,they say,which he put in a bottle and threw into the lake.

No-one thought Alphan would take on the task. He was too slight and gentle to wrestle the will of Omegan. True he has a map left to him by his explorer grandfather. What if he could bring Earth back to normal!

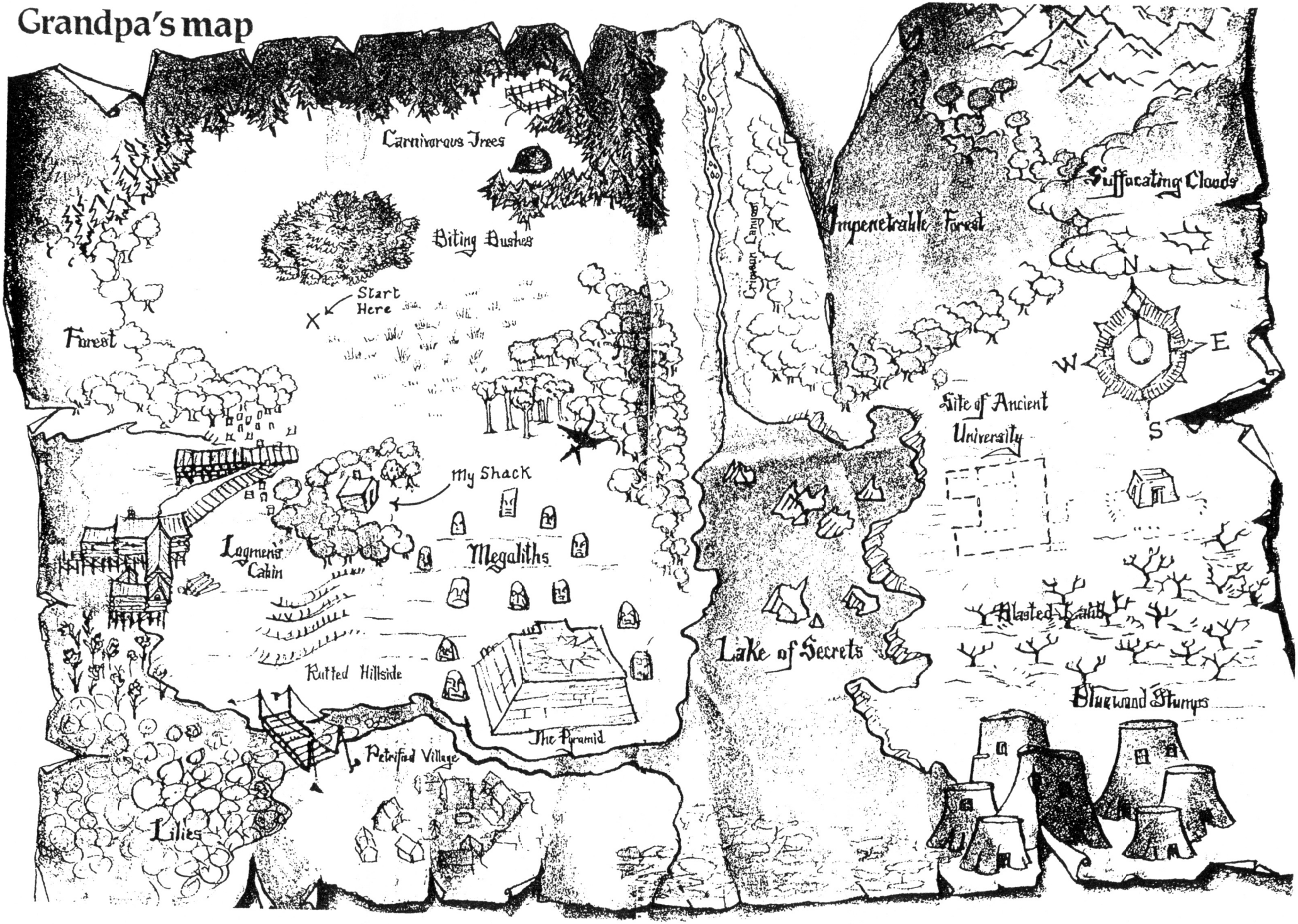
CHARACTERS YOU WILL MEET

Canyon Beasts You may come across them anywhere in the forest,though you won't catch one without help.
Speaking Stone Despite its name,this strange glassy boulder sits in dull silence.
Omegan He moves around the castle,so you can't be sure where you will meet him.
Swampman He lives in the stumps of the great bluewood trees,which his ancestors planted. He is a sworn enemy of the Logmen,but cannot leave the swamp to get revenge,or to get the liquor which he believes would restore the trees to their former glory.
The Boatman Even the canyon beast won't go near him,so beware. It would be wise to approach him at some stage in your quest though.
The Logmen These unfriendly characters are always on the lookout for something to entertain them. They are addicted to a lethally strong liquor which they brew themselves. Their logging activities include destroying the last of the great bluewood trees in the east. If they catch you,you could be in for a swim.
Median A famous scholar of ancient times. He disappeared under mysterious circumstances.
The Scavenger He appears to have lost his memory. Alphan will need to help him recover it somehow.
Dactyl She guards something precious. She'll need proof that you are serious about your mission.
Sage of the Lillies She has meditated for so long that she has forgotten how to move any thing other than her head. She has been vaguely worried for the last 500 years by a slight but persistent irritation on her back. The lillies she guards are said to revive old memories.

PLACES YOU WILL VISIT

The Pyramid The view from here is most impressive. Watch your step-there's a kind of hard grey stone here.
Granpa's Shack Alphan's grandfather built this shack next to the apple tree as a hide-away for himself.
Granpa's Chest Granpa kept useful things in here.
Well of Weakness Don't approach if you're not feeling strong. Omegan may be not far away.
Clashing Stones If you peer closely at these,you can just make out the following inscription: "Stony silence is not the thing. Say stony words that you must bring."
Petrified Village Lava engulfed this village so quickly that everthing was preserved in stone. It gives you some idea of what life was like long ago.
Logmens Cabin Don't hang around to long in here. Stolen goods often end up on the table. The floor could be your saviour.
Clone Factory Can this be the secret of Omegan's long life?
Abode Hut Someone appears to have lived here in recent times,but there's no sign of anyone now. Whats on the table?
Snelm's Lair It is said that one of the Ancients left a clue with Snelm. Look for a piece of old "paper".
Marble Column This is all that remains of the University of the Ancients.
Omegan's Sanctum The end of your journey,whatever its outcome. You can't escape. Watch your step here too.

Grandpa's map



A question of comfort

By George Forster, Silkwood Manufacturing

Practical computer ergonomics — nowadays, this is mostly commonsense, when combined with a lot of experience!

In 1983 we were one of the first to offer ergonomic computer furniture in New Zealand, we used the limited ergonomic information then available from USA and continental Europe to produce very workable designs.

With all keyboards etc, now being similar in size, we have learnt how to successfully optimise the essential settings rather than provide what we consider to be unnecessary adjustability. We aim to cater for all except exceptionally tall operators.

This works well. The total count of our specialised computer units now in use well exceeds 10,000 — without any reported cases of RSI.

Quite apart from the cost effectiveness of optimised designs, a major user benefit is that it is impossible for any operator to set himself/herself wrongly as so many do where adjustment is provided.

As computer buffs with principals continually using different machines, we test every development ourselves without relying on third party reports. Two of the settings we advocate were developed by chance as will be explained.

Here they are. These now simple recommendations are easily verified so you can form your own opinion. Notice that we do not quote millimetres and angles of inclination, but easy to follow (commonsense?) rules.

Chair: This height setting avoids restriction of blood flow to lower leg. Ideally the chair should have rounded front edge (called a "waterfall front") and it should really have gas rise and fall for simple adjustment.

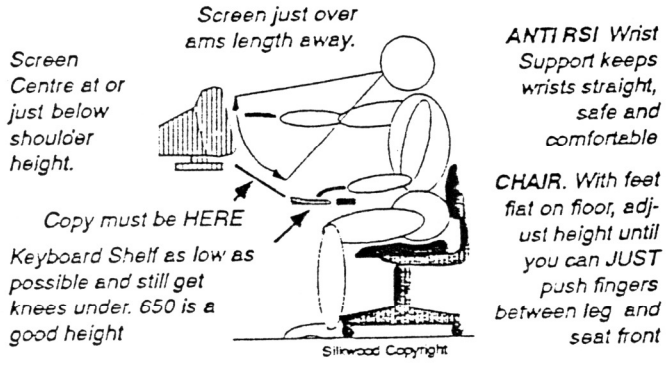
We believe it is the only thing that should be readily adjustable between operators.

We consider the back support setting can be left very much to operator preference. With the seat at the correct height as specified, you tend to sit upright much of the time not touching the back until you feel like slouching a bit (President of the Ergonomics Society, Professor Tony Vitalis of Massey University is reported to be considering a recommendation to slouch if you feel like it.)

Only a very petite person needs a footstool — and then a simple 50mm floor-raising thing like an Auckland telephone directory will do the job.

Keyboard height: You see our recommendation. Here is how you check it — sitting on your correctly set chair with your feet flat on the floor, put the keyboard on your knees. See how your hands just fall on to it and you can type without strain.

Once you have tried a just-above-the-knees keyboard, you will forget out-dated strictures about "arms at 90°" and "forearms parallel with the floor."



Wrist support: Here chance played a part many years ago. I well remember my indignation when a valued customer insisted on a wrist support.

Under protest, we developed a suitable one and tested it. Now I can not imagine why anyone knowing about it, would use a keyboard without a cushioned support in front of it.

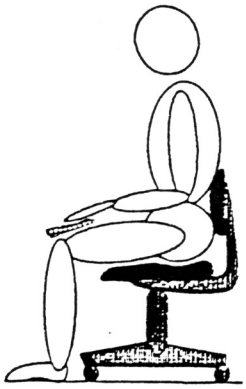
I personally believe that this single feature could have prevented much of the RSI that has been suffered in our country.

Here's how it works. Even on a correct height keyboard, tired arms can sink so the wrist is at an angle and this can cause strain — try bending one of your hands right up and then move your fingers as fast as you can. Feel it down the back of your hand?

With a support set about flush with the spacebar, you cannot touch the keys unless your wrists are straight. It's that simple.

To have a cushioned rest to drop hands on to when you pause is a great added bonus — and for operating a mouse or trackball, it is incredibly comfortable — but the prime and effective purpose is to keep wrists straight.

When we first saw the Code of Practice (this was after publication) we were dismayed to find that wrist supports only get a passing mention to the effect that some people may find them beneficial.

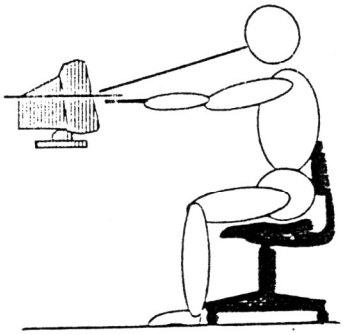


Screen distance: Over the years, we have realised that "just over arms length away" — the distance we have always used — is a much better focal distance than the 450mm minimum distance stipulated in the Code of Practice. We initially chose arms-length because it allowed us to put the copy at an angle between screen and keyboard. Then we bought a Static Meter and established that there are indeed static fields close to the screen which confirmed our choice of distance.

Now the Dept of Labour is also recommending "...operators should sit at an arms length from the front of their monitor..." (*Safeguard* August 1990 — presumably this revokes the "450-700mm" stipulation in the Code).

Seems we were right all along.

Screen height: There is a simple and very convincing test you can use to verify the "just under shoulder height" recommendation. Sitting on your correctly set chair, place a Post-it note or similar marker just below your shoulder height on a screen or any surface at arms length away.



Close your eyes, move your head around and facing front, re-open them.

Nine times out of 10 you will be looking at the marker — and so will any other people that you care to ask.

This surely proves that if the centre of the screen is at around average shoulder height, it suits 95% of people without any need for adjustability.

Copy position: We are surprised that anyone should consider any position other than at an angle between keyboard and screen.

There, the eyes just move up and down at approximately the same focal distance — and eyes were designed for continual movement.

The neck is not so good at continual movement it has to make if copy is up at one side — or even, would you believe, flat on the desk beside. Try it yourself.

Castors: The Code makes extensive recommendations for lighting and avoidance of glare and reflection.

This is all greatly simplified if the computer unit is on castors so the operator can move it slightly to achieve the optimum position in any particular environment.

Revision: I understand the Code is being revised at present. It will be interesting to see what changes are made.

Cost benefit: It actually pays to set operators up ergonomically. The minimum improvement in productivity to be reasonably expected in most circumstances is around 10%.

If this costs just a few hundred dollars, it is obviously going to pay for itself in months rather than years.

• George Forster is managing director of Silkwood Manufacturing Ltd.